▌Research Article

The Dual Impact of Exchange Rate Depreciation and Uncertainty on Budget Deficits of Pakistan

Malik Muhammad[1], Ume Kalsoom [2] and Fozia Sultana [3]

Abstract

This study examines the impact of exchange rate, exchange rate uncertainty and other macroeconomic variables on the budget deficit of Pakistan. By using data for the period 1982 to 2021, the ARDL Bounds Test confirmed a co-integration relationship among the variables. For regression analysis Fully Modified Least Squares (FMOLS) is used. Results reveal that currency depreciation positively affects the budget deficit due to increase in the cost of foreign debt services and imports, while exchange rate volatility worsens budget deficits by reducing trade and economic growth. Findings also show that instabilities of expenditure and revenue also increase the deficit due to dependence on unstable tax revenues and weak financial planning. Per capita GDP growth, used as a proxy for economic development, reduces deficits by increasing tax bases and raising government revenue. Findings further reveal that large government participation and seigniorage increase the budget deficits through inefficiencies and increase in inflation. Trade openness is found to decrease budget deficits as with the increase in openness i tax revenues from international trade also increases. Political regimes also significantly affect fiscal outcomes, with deficits being more evident under democratic governments. Debt servicing and interest rates are found to aggravate budget deficits, showing the cyclical nature of fiscal challenges of Pakistan. This study concludes that addressing exchange rate fluctuations, improving fiscal discipline, increasing economic growth, and enhancing trade openness are essential to achieving long-term fiscal sustainability in Pakistan.

Key Words: Exchange Rate, Exchange Rate Uncertainty, Budget Deficit

JEL Code: F31, H62, O24

1. Introduction

Budget deficit is one of the main issues of the developing countries which further leads to macroeconomic instability. Although borrowing to finance the budget deficit is a major issue of a country, but excessive printing of money and raising taxes are also playing a significant role in increasing inflation and interest rates, which negatively affect economic growth. Budget deficit

[1]Assistant Professor, IIIE, International Islamic University Islamabad. Contact: malikmuhammad@iiu.edu.pk
[2]Lecturer, University of Chakwal, Punjab. Contact: Kalsoom@uoc.edu.pk
[3]PhD Scholar, IIIE, International Islamic University Islamabad. Contact: fozimuaazhnni@gmail.com

financed through domestic borrowing puts upward pressure on interest rate, crowding out private investment and thereby reducing economic growth. On the other hand, budget deficit finance through external borrowing depletes the limited exports earnings and transfers the burden of debt servicing to the next generations. Printing money to monetizing the deficit can lead to increase in inflation rate, eroding real income of consumers and destabilize the economy. Although imposing taxes is a desirable policy but its implementation in democratic societies is often politically challenging, facing parliamentary resistance and public reaction. Further, impose taxes may also reduce disposable income and consumption and thus slowing economic activity. So, while borrowing is a key component of managing a budget deficit, excessive reliance on money printing and tax increases can create a vicious cycle that challenges long-term economic stability and growth.

The existing literature has identified numerous factors influencing budget deficits; yet only a few studies have explored the impact of exchange rate and its uncertainty on budget deficits. Currency devaluation can significantly affect budget deficits through channel of "Pass-Through" effect (Dornbusch, 1985). Devaluation raises the prices of imported inputs and goods, which subsequently trickle down to domestic prices. For developing countries which heavily rely on imported inputs for production, devaluation results in increased production costs and subsequently, government expenditure raises. These pressures can widen the budget deficit, especially if governments provide subsidies or intervene to stabilize prices of the essential goods (Krugman & Taylor, 1978). Besides, the rise in the general price level, without a corresponding increase in nominal wages, reduces real wages. As households' purchasing power decreases, the likelihood of wage demands increases, particularly in economies where the government is a major employer.

Meeting these demands often leads to higher government expenditures on wages, exacerbating budget deficit (Tanzi & Blejer, 1984).

On the hand exchange rate uncertainty can have profound implications for budget deficits through its effects on government revenues and expenditures. Exchange rate uncertainty increases risk for international trade and investment, as a result volume of export and import decreases (Campa & Goldberg, 1995). Subsequently, revenues from trade-related taxes, such as customs duties and export levies reduce. Additionally, exchange rate volatility can increase the unpredictability of the domestic cost of the imports, making fiscal planning difficult and leading to increase unanticipated government expenditure (Aghion et al., 2009). Also external debt servicing, particularly denominated in foreign currency, is affected by exchange rate uncertainty. Exchange rates fluctuations may increase the value of debt servicing in terms of domestic currency, exerting more pressure on fiscal resources (Eichengreen & Hausmann, 1999). This uncertainty can further upset private sector investment and growth, indirectly reducing tax revenues and exacerbating the budget deficit. Inflationary pressures often arise when budget deficit, resulting from exchange rate uncertainty, are monetized. This inflation, in turn, leads to asymmetric adjustments in revenues and expenditures—revenues may lag due to collection delays, while expenditures, especially indexed payments, rise more rapidly, further worsening the fiscal deficit (Tanzi, 1977).

Pakistan has been struggling with persistent budget deficits for decades. While there are multiple causes of budget deficits—varying from borrowing and printing of money to politically constrained tax reforms—the impact of exchange rate fluctuations and their associated uncertainties remains under investigated in the context of Pakistan. In import-dependent economies like Pakistan the currency devaluation widens budget deficits by raising the cost of

imports and government expenditures. Similarly, exchange rate uncertainty worsens budget deficits by reducing trade volumes, making revenue collection difficult, inflating the costs of external debt-servicing, and increasing unanticipated government expenditures. Since foreign debt and trade related taxes are important components of fiscal planning of Pakistan, therefore these dynamics have special concern for Pakistan.

The historical evidence shows that how fiscal position of Pakistan is weakened by exchange rate instability. From 9.90 per dollar in 1981 to a record 307.75 in September 2023, the value of the Pakistani rupee has drastically declined, increased the cost of servicing external debt as well as the domestic prices of imported commodities and government-subsidized essentials[4]. As a result, the budget deficit increased, and is further worsened by politically constrained tax reforms that limit domestic revenue generation. Exchange rate volatility also reduces the private investment and trade activity leading to reduce the tax base and further worsen budget deficits. Due to excessive printing of money, especially in recent years, to monetize budget deficit resulted in high inflation which further increased the deficit thus creating a vicious cycle[5].

Pakistan's economic history is characterized by episodic of fiscal improvements followed by sharp deteriorations. This emphasis to examine how exchange rate movement, uncertainty, and budget deficit are related. Investigating these relationships is not only crucial to address the fiscal challenges in the short run but also will help to formulate long-term policies for economic stability and fiscal resilience. The current study will fill a significant gap in existing literature by investigating the impacts of exchange rate fluctuations and uncertainty on the budget deficit of

[4] The exchange rate even reached to historical of 331 in Open Market on September, 2023.
[5] The inflation rate was 19.9% in 2022 and increased to 38.8% in 2023. The budget deficit increased to 7.7% of GDP in fiscal year 2023-24

Pakistan. Furthermore, it will also examine the impact of other macroeconomic variables on the budget deficit of Pakistan. The specific objectives of the study are as follows:

- To analyze the impact of the exchange rate on budget deficit of Pakistan.
- To examine the effect of exchange rate uncertainty on budget deficit of Pakistan.
- To investigate the influence of other macroeconomic variables, including fluctuations in public revenues and expenditures, economic growth, the extent of government involvement in the economy, the inflation rate, military and democratic regimes, and the burden of debt servicing, on budget deficit of Pakistan.

Addressing these objectives aims to provide a comprehensive understanding of the factors, in particular the role of the exchange rate, responsible for budget deficit in Pakistan.

2. Literature Review

The relationship between exchange rate and budget deficits has been a focused point of researchers, particularly for developing and emerging countries where fiscal stability is often vulnerable to external shocks. In addition to affecting the cost of debt servicing denominated in foreign currencies, exchange rates and their uncertainty can cause disruptions in governmental revenue and expenditures, which exacerbates budget deficit. Exchange rate and its uncertainty can impair government revenue and spending, which worsens the budget deficit, in addition to having an impact on the cost of repaying debt denominated in foreign currencies. This review of literature explores the multifaceted dynamics of this relationship, using on a wide range of studies that illustrate the mechanisms through which exchange rate movements affect fiscal performance. From the debt crises in Latin America to the fiscal challenges in trade-dependent economies and country-specific analyses in regions such as South Asia and Europe, this review offers a thorough

understanding of how exchange rate and its volatility are both a sign and a cause of fiscal vulnerabilities.

Calvo et al. (1993) examined how exchange rate volatility disrupted of fiscal stability during Latin American debt crises. Eichengreen and Hausmann (1999) argued that exchange rate depreciation raises the cost of debt service for foreign-denominated debt, hence making fiscal deficits worse. By linking exchange rate to budget deficits, Corsetti and Müller (2006) suggested that exchange rate misalignment exacerbated budget deficits in European Union. Agénor and Aizenman (2007) found that high inflation coupled with exchange rate depreciation exacerbated budget deficits in developing countries. Poghosyan (2012) observed that depreciation raised debt-servicing costs in Eastern Europe, while Celasun and Kang (2006) noted similar fiscal pressures in developing economies with significant external debt.

Uncertainty of exchange rate volatility further deepens fiscal challenges, particularly for countries that rely heavily on trade. In such economies, exchange rate instability results in larger revenue shortfalls, as shown by Frankel and Rose (1996). According to Aizenman and Marion (1999), exchange rate uncertainty destabilizes government revenues and expenditures which cause fiscal volatility. While Reinhart and Rogoff (2009) found that fiscal crises often precede exchange rate instability, Bleaney and Fielding (2002) and Lane (2003) highlighted that exchange rate volatility,, in trade-dependent countries undermined fiscal sustainability. Goyal (2011) noted that during periods of high import dependency, fluctuation in rate changes increased fiscal pressure in India. Similarly, Araújo and da Silva (2012) revealed that exchange rate volatility reduced revenues in Brazil and worsened deficits. South Asia exchange rate instability, according to Ahmed and Kadir (2017), destabilized fiscal budgets by reducing trade and tax revenues.

In the context of Pakistan, studies have shown that exchange rate depreciation and its volatility have detrimental impacts on budget deficit. Depreciation raised import prices and debt-servicing liabilities which exacerbated fiscal deficits (Malik et al. 2010). One of the main cause of growing budget deficit, according to Zaidi (2016) is exchange rate mismanagement. Iqbal et al. (2019) highlighted that exchange rate uncertainty as a major of source of fiscal deficits, particularly under weak fiscal governance. Haque et al. (2020) revealed that policy inaction increases budgetary pressures causing budget deficit under exchange rate uncertainty. Muhammad et al. (2023) highlighted that instabilities in government revenues and expenditures, government participation in the economy, debt servicing, and inflation play significant roles in fueling budget deficits; and government revenues and GDP growth mitigate budget deficits.

3. Theoretical Framework and Empirical Model

The link between exchange rates, exchange rate uncertainty, and budget deficits can be analyzed through a combination of different economic theories and frameworks that interconnect fiscal policy, trade, capital flows, and macroeconomic stability. The exchange rate is a key fact that determines competitiveness of a country at international level, affecting, government revenues, fiscal expenditures, and trade balances.

Purchasing Power Parity postulates that exchange rate movements affect the relative prices of traded goods, which in turn affects trade-related government revenue. Import prices increase as a consequence of currency depreciation, which in turn causes inflation and an increase in nominal government expenditures. The theory of sovereign debt sustainability states that currency depreciation increases the cost of external debt servicing, escalating fiscal burdens. Governments have to allocate additional resources to debt repayment, potentially worsening budget deficits. The twin deficits hypothesis establishes a link between fiscal deficits and current account deficits, with

exchange rate dynamics playing a pivotal role. Depreciation of exchange rate with an objective to reduce trade deficits can increase the cost of external debt servicing and import good, thereby exacerbating budget deficits. On the other hand, budget deficits can put pressure on exchange rates to depreciate through increase in borrowing and reducing in investor confidence, creating a vicious cycle of fiscal and exchange rate instability. The "Exchange Rate Pass-Through Hypothesis" postulates that high inflation, combined with currency depreciation, drains fiscal resources by increasing the cost of imports and subsidies. This intensifies fiscal pressures, especially in imports-dependent economies. According to the Mundell-Fleming model, exchange rate volatility can destabilize fiscal stabilization efforts under high capital mobility, making difficult for government to manage budget deficits.

Exchange rate uncertainty introduces substantial uncertainty in fiscal planning and execution. This can upset trade flows, sinking revenues from trade taxes, particularly in trade dependent economies. The Keynesian framework advocates that this uncertainty complicates fiscal adjustments, as governments face difficulties in balancing budgets due to unpredictable revenue streams and obstinate expenditure obligations. Moreover, uncertainty of exchange rate can reduce investment and consumption, further reducing tax revenues. Governments may resort to fiscal stimulus measures aimed at stabilizing the economy during periods of heightened exchange rate volatility. However, such interventions often widen budget deficits, exacerbating the fiscal challenges.

Our basic mathematical model is:

$$BD_t = f(ER_t, EXVOL_t) \tag{3.1}$$

Where, BD_t , ER_t, and $EXVOL_t$ are budget deficit as a percentage of GDP, the exchange rate, and uncertainty of the exchange rate at time "t", respectively.

Moreover, government revenue and expenditure instability significantly contribute to budget deficits. Fluctuations in government revenue can lead to instability in government spending (Lim David, 1983). When government revenues are uncertain, it becomes difficult to plan and allocate expenditures effectively. This can result into instable government consumption and investment spending, which can negatively impact GDP and exacerbate budget deficits.

Further, economic theory suggests a negative impact of economic development and growth on budget deficits. As economies expand, government revenues tend to increase, even without raising tax rates. The type of government can also affect budget deficits. Civilian governments spend more and increase budget deficit as they are more responsive to public demands. Contrary, military governments often place more priority on macroeconomic stability and fiscal discipline, leading to concentrate on reducing deficits. It is also argued that the problem of budget deficit is intensified more with the increase in government debt. With the increase in debt, governments have to allocate a larger portion of their budgets to debt servicing. This can crowd out government expenditures on investments in infrastructure and education etc., which are essential for long-term economic growth. As a result, debt repayment can increase budget deficits.

Besides, a lag budget deficit can influence the current budget deficit. A larger past deficit often translates into higher outstanding debt. Interest payments on this debt can consume a significant portion of the current budget. Further, a high levels of past debt can negatively impact market sentiment, making it more expensive for the government to borrow, thus increasing interest costs on current borrowing. Higher interest rates crowd out private investment and reduce economic growth. Lower economic growth can translate into lower tax revenues, exacerbating the current budget deficit.

Finally, trade openness, government revenue and the extent to which government participate in the economy can also significantly contribute to budget deficit.

Based on above discussion our model takes the form

$$BD_t = f(ER_t, EXVOL_t, VOREV_t, VOEXP_t, ED_t, NG_t, DS_t, S_t, TO_t, GRE_t, GRP_t, IR_t, BD_{t-1}) \quad (3.2)$$

Where $VOREV_t, VOEXP_t, ED_t, NATR_t, DS_t, S_t, TO_t, GRE_t, GRP_t$, IR_t and BD_{t-1} represent instability of government revenues, instability of government expenditure, economic development, type of government, debt servicing, seigniorage , trade openness, government revenue, government participant in economic activity, interest rate, and lag budget deficit, respectively at time "t"

In stochastic form, equation (3.2) can be written as:

$$BD_t = \beta_0 + \beta_1 ER_t + \beta_2 EXVOL_t + \beta_3 VOREV_t + \beta_4 VOEXP_t + \beta_5 ED_t + \beta_6 NG_t + \beta_7 DS_t + \beta_8 S_t + \beta_9 TO_t + \beta_{10} GRE_t + \beta_{11} GRP_t + \beta_{12} IR_t + \beta_{13} BD_{t-1} + u_t \quad (3.3)$$

u_t is stochastic error term.

4. Data Source and Variables Descriptions

For empirical analysis, we used time series data for the period 1982 to 2021 for Pakistan[6]. Data source and variables used in our analysis are summarized in Table 4.1.

Table 4.1: Data Sources and Variables Descriptions

Variable	Description/Proxy	Source
Budget Deficit	Government Spending minus Revenue as Percentage of GDP	WDI
Exchange rate	Rupees/Dollar	IFS

[6] We select data from 1982 because before this period Pakistan was following fixed exchange rate system.

Exchange rate volatility	Generated by Fitting ARCH Model to Exchange rate	Author Own Calculations
Economic Development	Log Per Capita GDP	WDI
Type of Government	Dummy Variable, "1" For Democracy, "0" For Dictatorship	Author Own Calculations
Revenue Instability	Generated by Fitting ARCH Model to Revenue	Author Own Calculations
Expenditure Instability	Generated by Fitting ARCH Model to Expenditure	Author Own Calculations
Debt Servicing	Log of Principal Amount and Interest Payments on The Country's Outstanding Debt	Pakistan Economic Survey
Government Participation in	Log of Total Government Expenditure Net of Debt Payments	Pakistan Economic Survey
Government Revenue	Log of Total Tax and Non-Tax Revenue of The Government	Pakistan Economic Survey
Seigniorage	Log of M1	Pakistan Economic Survey
Trade Openness	Sum of Exports and Imports as a Percentage of GDP	WDI
Interest Rate	Nominal Annual Interest Rate	IFS

5. Results and Discussion

Prior to the regression analysis, we assess the time series properties of the variables. Most of the variables are integrated of order one, except for the interest rate and expenditure instability, which are stationary at their levels, as indicated in the upper panel of Table 5.1. The results of the ARDL Bounds test, presented in the lower panel of Table 5.1, confirm the existence of a cointegration relationship among the variables.

Table 5.1: ADF Unit Root Test and ARDL Bound Cointegration Test

Variables	**ADF-Statistics**				**Level of Integration**
	Levels		**1st Difference**		
	t-stat	**p-value**	**t-stat**	**p-value**	
Budget Deficit	-2.08	0.25	-8.27	0.000	I**(1)**
Log Exchange Rate	-0.654	0.845	-4.370	0.001	I**(1)**
Exchange Rate Volatility	-2.046	0.266	-4.640	0.000	I**(1)**
Revenue Instability	-1.822	0.364	-6.437	0.000	I**(1)**

Expenditure Instability	-4.706	0.000	-	-	I**(0)**
Log Economic Development	-0.832	0.797	-6.125	0.000	I**(1)**
Log Debt Servicing	0.191	0.968	-9.426	0.000	I**(1)**
Log M1 (Seigniorage)	-0.671	0.841	-5.115	0.000	I**(1)**
Trade Openness	-2.704	0.082	-6.558	0.000	I**(1)**
Interest Rate	-5.122	0.000	-	-	I**(0)**
Log Government Revenue	-1.261	0.636	-6.164	0.000	I**(1)**
Log Government Participation	-0.368	0.904	-6.124	0.000	I**(1)**

ARDL Bound Cointegration Test					
	Values	**K**	**Level of sig.**	Critical Values	
				I(0)	I(1)
F-Statistics	35.7	12	1%	2.41	3.61
	35.7	12	2.5%	2.18	3.28
	35.7	12	5%	1.98	3.04
	35.7	12	10%	1.76	2.77

After establishing co-integration, we employed the Fully Modified Least Squares (FMOLS) method to estimate equation 3.3. FMOLS provides efficient estimates by addressing issues of serial correlation and endogeneity in the model[7]. We used four different specifications. In all four specifications the results are robust, the main variables carrying same signs and almost same magnitude in all four specifications. The results of the FMOLS analysis are presented in Table 5.2

Table 5.2 the Fully Modified Least Squares (FMOLS) Co-integrating Regression

Explanatory variables	**MODEL (1)**	**MODEL (2)**	**MODEL (3)**	**MODEL (4)**
Constant	0.212* (0.025)	0.237* (0.027)	0.284* (0.013)	0.281* (0.013)
Budget deficit lagged	0.091* (0.030)	0.084* (0.032)	0.114* (0.014)	0.069* (0.016)
Log Exchange Rate	0.042* (0.007)	0.042* (0.008)	0.026* (0.003)	0.023* (0.003)
Exchange rate uncertainty	6.365* (0.350)	5.837* (0.371)	5.146* (0.168)	5.163* (0.170)
Instability-Revenues	0.071* (0.009)	0.073* (0.010)	0.084* (0.004)	0.095* (0.004)
Instability-Expenditure	0.028 (0.027)	0.052* (0.035)	0.166* (0.015)	0.163* (0.016)

[7] A larger budget deficit can stifle economic growth through the crowding-out effect. Increased government borrowing can drive up interest rates, reducing private investment and thereby hindering economic development (Fatima et al., 2012).

Log Economic Development	-0.075* (0.005)	-0.092* (0.011)	-0.072* (0.005)	-0.069* (0.005)
Nature of Govt.	0.015* (0.001)	0.017* (0.001)	0.016* (0.001)	0.016* (0.001)
Log Debt. Servicing	0.016* (0.002)	0.015* (0.002)	0.015* (0.001)	0.015* (0.001)
Log M1 (Seigniorage)	0.020* (0.003)	0.033* (0.008)	0.036* (0.004)	0.028* (0.004)
Trade Openness	-	-0.068*** (0.039)	-0.105* (0.019)	-0.113* (0.019)
Log Govt. Revenues	-	-	-0.039* (0.002)	-0.035* (0.002)
Log Govt. Participation	-	-	0.021* (0.002)	0.024* (0.002)
Interest Rate	-	-	-	0.001* (0.0001)
R^2	0.894	0.895	0.906	0.906
F-stat	29.99	27.28	25.70	23.73
Prob(F-stat)	(0.00)	(0.00)	(0.00)	(0.00)

Note: In parentheses, standard errors are shown. The asterisks (*), (**),(***) indicate a significant level at 1%, 5% and 10%.

The lagged budget deficit has a positive impact on the current budget deficit. High past deficits lead to the higher current deficits highlighting the persistent nature of fiscal deficits. This finding is consistent with Roubini and Sachs (1989) and Adedeji and Williams (2007), which emphasize the persistent nature of fiscal deficits. The inclusion of the lagged variable also addresses serial correlation issues, as suggested by Drukker (2003).

Currency depreciation significantly increases the budget deficit. Depreciation raises the cost of foreign debt repayments and debt servicing in local currency, thereby inflating government expenditures. This aligns with the balance of payments approach, which states that depreciation initially worsens trade balances before improving them due to lag effects. Similar conclusions are drawn by Corden (1989).

Exchange rate uncertainty significantly exacerbates the budget deficit. uncertainty increases trade risks, reduces export competitiveness, and forces reallocation of resources from tradable to less risky non-tradable sectors to protect earnings. This disrupts economic growth, forcing governments to rely on additional borrowing, which further increases budget deficits. Empirical evidence supporting this view is provided by Nwaeze et al. (2017).

Government revenue instability is positively correlated with the budget deficit. Revenue instability is often driven by low economic growth, inflation, and high GDP volatility. This finding aligns with Morrison (1982), who highlighted the adverse effects of revenue instability on fiscal balance.

Expenditure instability also worsens the budget deficit. In developing countries like Pakistan, revenue instability often translates into expenditure volatility due to reliance on unstable tax collections. Ineffective fiscal management and rigid expenditure structures such as defense, education, financing state owned enterprises, and infrastructure spending, exacerbate the problem, as also noted by Bleaney et al. (1995) and Lim (1983).

Higher levels of economic development (measured by per capita GDP) negatively affect the budget deficit. As economies develop, broader tax bases and higher income levels naturally enhance government revenues, reducing fiscal shortfalls. During economic progress wage, profit levels, personal income taxes, value-added taxes, and corporate taxes increases which lowers the budget deficit. As a result, targeting higher levels of economic growth and development is the surest way to reduce the budget deficit without raising tax rates. This finding aligns with Morrison (1982), Wu (2003), and Anwar and Ahmed (2012), emphasizing the role of growth-driven fiscal consolidation.

The type of governance significantly affects the budget deficit. Although Pakistan's fiscal deficits have persisted under both regimes, reflecting systemic fiscal challenges, however, results show that deficit is to be large in democratic compared with military-led governments. Our results are contradict to the findings of Raheem et al. (2014) and Woo (2003) who find insignificant results, suggesting regime type has minimal impact on fiscal outcomes.

Debt servicing has a significant positive relationship with the budget deficit. Increasing debt services reduces economic development because more resources allocated for this purpose and less to development expenditures. Moreover, due to increase in debt servicing cost, obtaining more funding from donor countries becomes more difficult, as they demand greater interest payments owing to the increased risk of a budget deficit. The findings are consistent with Sachs and Larrain (1993), Onyango and Ochieng (2013), and Joseph Sirengo (2014).

Seigniorag - money creation- contributes positively to budget deficits, with a rise in seigniorage increasing the deficit. Delays in tax collection and inflation-driven spending exacerbate this relationship. The findings align with the Olivera-Tanzi effect described by Solomon and Wet (2004). Trade openness reduces budget deficits. Increase in trade openness increases the trade volume, increasing tax revenue from the foreign trade and thus reduces budget deficits.

The impact of interest rates on the budget deficit is significantly positive with a rise in interest rates leading to increase the deficit. Rising interest rate raises government's borrowing costs, government pay more interest on the debt it has issued which will further increase the budget deficit. This finding is align with AL-Khedar (1996) and Aisen and Hauner (2008).

Higher government revenues reduce budget deficits, with increase in revenues linked to a decrease in deficit. An improved tax system and broad tax base can increase the government

revenues which are essential for fiscal sustainability. This finding aligns with Morrison (1982) and Onyango and Ochieng (2013).

Increased government participation in the economy positively impacts the budget deficit. High administrative costs and inefficient public enterprises, as noted by Morrison (1982) and Anwar and Ahmad (2012), exacerbate fiscal challenges and increases budget deficits. The budget deficit rises as the government becomes more involvement in the economy. The government has to finance public goods with limited resources in developing countries. If the government size is large, the scarce resources must be diverted from directly productive channels to the relatively less effective social sector, compromising economic development and increasing budget deficits. Providing public goods and services in general, and providing subsidies on specific things in particular, is seen as a political responsibility by the general public. The political opposition takes advantage of citizens' reliance on the government to supply all of their demands. As a result, in developing countries governments struggle to keep their spending under control, resulting in an ever-increasing budget imbalance. Another key contributor to Pakistan's budget deficit is the ownership of non-profit public-sector enterprises such as PIA, WAPDA, Railways, and Steel Mills etc.

6. Conclusions and Policy Recommendations

The study main objective was to investigate the impacts of exchange rate and its volatility on budget deficit of Pakistan. The analysis revealed that Pakistan's budget deficit is influenced by various economic, structural, and governance factors. Persistent budget deficits, driven by exchange rate, exchange rate uncertainty, revenue and expenditure instability, high costs of debt servicing, and past deficits, put significant challenges to fiscal sustainability and budget deficit of Pakistan. On the other hand, economic development and trade openness positively impact fiscal

outcomes and reduce budget deficit. These findings highlight the need for comprehensive reforms to address issue of increased budget deficits.

- The positive impacts of exchange rate depreciation and its uncertainty on budget deficits are significant concerns for policymakers. Policy makers can successfully address the issues posed by exchange rate depreciation and its uncertainty by implementing appropriate policy measures, and thus can mitigate their impacts on budget deficits. To prevent excessive exchange rate volatility, policy makers should allow gradual adjustments to external shocks. Improve the investment climate, attract foreign direct investment and strengthen foreign exchange reserves to fight against external shocks and currency instability. Maintain stability and reduce exchange rate volatility by adopting a credible inflation targeting framework. Finally to mitigate exchange rate risks policy makers should encourage the use of financial instruments.
- Improving the tax system is critical to increasing government revenues. Broadening the tax base and reducing reliance on indirect taxes can contribute to a sustainable fiscal structure.
- The government should restructure debt to reduce servicing costs. This includes prioritizing concessional loans over commercial borrowing and increasing reliance on domestic revenue generation to fund fiscal needs.
- Policies that enhance GDP per capita, such as fostering economic growth and job creation, should be prioritized. Higher personal incomes will increase direct tax revenues, reducing the budget deficit over time.
- Privatization or restructuring of loss-making state-owned enterprises like PIA, WAPDA, Steel Mill and Pakistan Railways should be considered.

- Greater trade openness can generate additional tax revenues and reduce fiscal imbalances. Policies to support trade liberalization and integration with global markets should be pursued.

Persistent fiscal deficits are a significant challenge for developing countries like Pakistan. Implementing the above recommendations can help control budget deficits, ensuring fiscal sustainability and fostering economic growth. By addressing the structural and governance issues that exacerbate fiscal imbalances, policymakers can create a stable macroeconomic environment conducive to long-term development.

References

Adedeji, O., & Williams, O. H. (2007). "Fiscal Reaction Functions in the CFA Zone: An Analytical Perspective." *IMF Working Papers*, October 2007: 21.

Agénor, P. R., & Aizenman, J. (2007). Infrastructure and fiscal policies in developing countries, *Journal of Public Economic Theory*, *9*(6), 925–939.

Aghion, P., Bacchetta, P., Rancière, R., & Rogoff, K. (2009). Exchange rate volatility and productivity growth: The role of financial development. *Journal of Monetary Economics, 56*(4), 494–513.

Ahmed, S., & Kadir, S. (2017). Exchange rate volatility and trade performance: Evidence from South Asia. *Journal of Economic Integration*, *32*(1), 83–123.

Aisen, A., & Hauner, D. (2008). Budget deficits and interest rates: A fresh perspective. *IMF Working Papers*, 2008(42), 1-20.

Aizenman, J., & Marion, N. (1999). Volatility and investment: Interpreting evidence from developing countries. *Economica*, *66*(262), 157–179.

Al-Khedar, H. A**.** (1996). Government budget deficits and interest rates: Evidence from the Gulf countries. *Applied Economics Letters*, *3*(12), 807–810.

Anwar, S., & Ahmad, J. (2012). Government size, fiscal policy, and economic growth: Empirical evidence from Pakistan. *Journal of Economic Studies*, *39*(1), 54–70.

Araújo, E., & da Silva, A. (2012). Exchange rate volatility and trade flows: Evidence from Brazil. *Economic Systems*, *36*(4), 517–536.

Bleaney, M., Gemmell, N., & Greenaway, D. (1995). Tax revenue instability, with particular reference to sub-Saharan Africa. *The Journal of Development Studies*, *31*(6), 883-902.

Bleaney, M., & Fielding, D. (2002). Exchange rate regimes, inflation, and output volatility in developing countries. *Journal of Development Economics*, *68*(1), 233–245.

Calvo, G. A., Leiderman, L., & Reinhart, C. M. (1993). Capital inflows and real exchange rate appreciation in Latin America: The role of external factors. *IMF Staff Papers*, *40*(1), 108–151.

Campa, J. M., & Goldberg, L. S. (1995). Exchange rate pass-through into import prices. *The Review of Economics and Statistics, 87*(4), 679–690.

Celasun, O., & Kang, J. S. (2006). On the dynamics of external debt and growth. *World Bank Policy Research Working Paper* No. 3451.

Corden, W.M., 1989, 'Macroeconomic adjustment in developing countries', World Bank Research Observer, *4*(1), pp. 5 1-64.

Corsetti, G., & Müller, G. J. (2006). Twin deficits: Squaring theory, evidence and common sense. *Economic Policy, 21*(48), 597–638.

Dornbusch, R. (1985). *Exchange rates and inflation*. MIT Press

Drukker, D. M. (2003).Testing for serial correlation in linear panel-data models. *The stata journal*, *3*(2), 168-177

Eichengreen, B., & Hausmann, R. (1999). Exchange rates and financial fragility. *National Bureau of Economic Research Working Paper No. 7418.*

Frankel, J. A., & Rose, A. K. (1996). Currency crashes in emerging markets: An empirical treatment. *Journal of International Economics, 41*(3–4), 351–366.

Goyal, A. (2011). Inflationary pressures and monetary policy options in India. *Economic and Political Weekly, 46*(26–27), 50–57.

Haque, N., Ahmed, A., & Iqbal, M. (2020). Exchange rate uncertainty and fiscal policy: Lessons from Pakistan. *SBP Research Bulletin, 16*(2), 23–40.

Iqbal, J., Ahmed, S., & Ali, M. (2019). Exchange rate uncertainty and fiscal performance in Pakistan. *Pakistan Development Review, 58*(3), 291–308.

Joseph Sirengo, N. (2014). The effect of public debt on economic growth in Kenya. *Journal of Economics and Sustainable Development, 5*(1), 24–32.

Krugman, P., & Taylor, L. (1978). Contractionary effects of devaluation. *Journal of International Economics, 8*(3), 445-456.

Lane, P. R. (2003). The cyclical behaviour of fiscal policy: Evidence from the OECD. *Journal of Public Economics, 87*(12), 2661–2675.

Lim, D. (1983). Fiscal policy and economic growth in developing countries. *World Development, 11*(5), 399–406.

Malik, W. S., Aftab, M., & Khan, A. (2010). Fiscal deficits and inflation: New evidence from Pakistan using a bounds testing approach. *The Lahore Journal of Economics, 15*(2), 45–56.

Morrison, T. K. (1982). Structural determinants of government budget deficits in developing countries. *World Development, 10*(6), 467–472.

Muhammad, M., Chaudhry, M. A., Syed, S. H., & Saeed, M. (2023). Instability of government revenues and expenditures: implications for budget deficit in Pakistan. *Quality & Quantity*, *57*(6), 4971-4983.

Nwaeze, N. C., Kalu, I. E., & Tamuno, S. O. (2017). Exchange rate volatility and fiscal deficit in Nigeria: Any causality? (1970-2016). *Greener Journal of Economics and Accountancy, 6*(3), 82-95.

Onyango, E. A., & Ochieng, O. D**.** (2013). Public debt and economic growth in Kenya. *International Journal of Economics and Research*, *4*(3), 27–43.

Poghosyan, T. (2012). Long-run and short-run determinants of sovereign bond yields in advanced economies. *IMF Working Paper*, WP/12/271.

Raheem, M. I., et al**.** (2014). Democracy, governance, and fiscal policy in Sub-Saharan Africa. *African Development Review*, *26*(3), 484–495.

Reinhart, C. M., & Rogoff, K. S. (2009). *This Time is Different: Eight Centuries of Financial Folly*. Princeton University Press.

Roubini, N., & Sachs, J. (1989).Government spending and budget deficits in the industrial countries. *Economic policy, 4*(8), 99-132.

Sachs, J. D., & Larrain, F**.** (1993). Macroeconomics in the global economy. New York: Harvester Wheatsheaf.

Solomon, M., & Wet, T. D**.** (2004). The Olivera-Tanzi effect in South Africa. *South African Journal of Economics*, *72*(1), 39–50.

Tanzi, V. (1977). Inflation, lags in collection, and the real value of tax revenue. *IMF Staff Papers, 24*(1), 154–167.

Tanzi, V., & Blejer, M. I. (1984). Public finance in developing countries. *World Development, 12*(4), 415-436.

Woo, J**.** (2003). Economic, political, and institutional determinants of public deficits. *Journal of Public Economics*, *87*(3-4), 387–426.

Wu, J. L**.** (2003). A dynamic analysis of budget deficit, money creation, and inflation. *Journal of Economic Studies*, *30*(5), 502–519.

Zaidi, S. A. (2016). Mismanagement of exchange rate policy in Pakistan: Causes and consequences. *Economic and Political Weekly*, *51*(42), 53–60.